

## PATENT COOPERATION TREATY

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INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY  
(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference <b>9528WO/HK</b>	<b>FOR FURTHER ACTION</b> See Form PCT/IPEA/416	
International application No. <b>PCT/SE2004/000647</b>	International filing date (day/month/year) <b>28.04.2004</b>	Priority date (day/month/year) <b>30.04.2003</b>
International Patent Classification (IPC) or national classification and IPC <b>H01C 7/12, H02H 1/04 H01H 9/04</b>		
Applicant <b>ABB Technology Ltd et al</b>		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 3 sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:
- a. ☒ (sent to the applicant and to the International Bureau) a total of 2 sheets, as follows:
- ☒ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
- ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
- b. ☐ (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) \_\_\_\_\_, containing a sequence listing and/or tables related thereto, in electronic form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:
- |                                     |              |   |
|-------------------------------------|--------------|---|
| <input checked="" type="checkbox"/> | Box No. I    | Basis of the report   |
| <input type="checkbox"/>            | Box No. II   | Priority  |
| <input type="checkbox"/>            | Box No. III  | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability  |
| <input type="checkbox"/>            | Box No. IV   | Lack of unity of invention  |
| <input checked="" type="checkbox"/> | Box No. V    | Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |
| <input type="checkbox"/>            | Box No. VI   | Certain documents cited   |
| <input type="checkbox"/>            | Box No. VII  | Certain defects in the international application  |
| <input type="checkbox"/>            | Box No. VIII | Certain observations on the international application   |

Date of submission of the demand <b>30.11.2004</b>	Date of completion of this report <b>11.07.2005</b>
Name and mailing address of the IPEA/SE Patent- och registreringsverket Box 5055 S-102 42 STOCKHOLM Facsimile No. +46 8 667 72 88 Form PCT/IPEA/409 (cover sheet) (April 2005)	Authorized officer  <b>Antonio Farieta /OGU</b> Telephone No. +46 8 782 25 00

# INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/SE2004/000647

## Box No. I Basis of the report

1. With regard to the language, this report is based on:

- ☐ the international application in the language in which it was filed
- ☐ a translation of the international application into \_\_\_\_\_, which is the language of a translation furnished for the purposes of:
- ☐ international search (Rules 12.3(a) and 23.1(b))
- ☐ publication of the international application (Rule 12.4(a))
- ☐ international preliminary examination (Rules 55.2(a) and/or 55.3(a))

2. With regard to the elements of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

- ☐ the international application as originally filed/furnished
- ☒ the description:
- pages 1 - 8 \_\_\_\_\_ as originally filed/furnished
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☒ the claims:
- pages \_\_\_\_\_ as originally filed/furnished
- pages\* \_\_\_\_\_ as amended (together with any statement) under Article 19
- pages\* 9 - 10 \_\_\_\_\_ received by this Authority on 20-04-2005
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☒ the drawings:
- pages 1 - 2 \_\_\_\_\_ as originally filed/furnished
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_

☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, Nos. \_\_\_\_\_
- ☐ the drawings, sheets/figs \_\_\_\_\_
- ☐ the sequence listing (*specify*): \_\_\_\_\_
- ☐ any table(s) related to the sequence listing (*specify*): \_\_\_\_\_

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, Nos. \_\_\_\_\_
- ☐ the drawings, sheets/figs \_\_\_\_\_
- ☐ the sequence listing (*specify*): \_\_\_\_\_
- ☐ any table(s) related to the sequence listing (*specify*): \_\_\_\_\_

\* If item 4 applies, some or all of those sheets may be marked "superseded."

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/SE2004/000647

**Box No. V** Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

## 1. Statement

Novelty (N)	Claims	<u>1-8</u>	YES
	Claims		NO
Inventive step (IS)	Claims	<u>1-8</u>	YES
	Claims		NO
Industrial applicability (IA)	Claims	<u>1-8</u>	YES
	Claims		NO

## 2. Citations and explanations (Rule 70.7)

Documents cited in the International Search Report:

D1) EP 0683496 A1  
D2) US 5517382 A  
D3) US 5113306 A  
D4) US 4989115 A  
D5) JP 2002015904 A

The cited documents represent the general state of the art.

The invention defined in amended claims 1-8 is not disclosed by any of these documents.

The cited prior art does not give any indication that would lead a person skilled in the art to the claimed surge arrester. Therefore, the claimed invention is not obvious to a person skilled in the art.

Accordingly, the invention defined in amended claims 1-8 is novel and is considered to involve an inventive step. The invention is industrially applicable.

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# CLAIMS

1. A surge arrester (1) comprising

a stack (10) of a plurality of cylindrical varistor blocks (10a), preferably made of metal oxide, which are arranged one after the other in the axial direction of the varistor blocks (10a),

an upper end electrode (11) and a lower end electrode (12),

clamping members (15) of insulating material comprising at least three loops (15a), of continuously wound glass fibre, which connect the upper end electrode (11) to the lower end electrode (12), wherein each of said loops (15a) comprises a first and a second strand,

a bursting-protective bandage (16) in the form of a plurality of rings or bands (16a) wound of fibre, said bandage (16) radially surrounding the varistor stack (10) and the clamping loops (15a), and

a surrounding, electrically insulating, outer casing (19) of rubber or other polymeric material,

characterized in that

a first cross section (V) of the first strand is mirror symmetric to a second cross section (H) of the second strand, and that a symmetry axis of the first cross section is inclined to a corresponding symmetry axis of the second cross section.

2. A surge arrester (1) according to claim 1, characterized in that the asymmetrical cross sections of the loops (15a) are shaped and located so that not only two corners, one on either strand, make contact with the varistor stack (10).

3. A surge arrester (1) according to claim 1,  
characterized in that the asymmetrical cross sections of  
the loops (15a) are adapted to increase the contact surface  
5 against the varistor stack (10).

4. A surge arrester (1) according to claim 1,  
characterized in that the asymmetrical cross sections of  
the loops (15a) are adapted to shorten the free span of the  
10 rings or bands (16a) inside the loops (15a).

5. A surge arrester (1) according to claim 1,  
characterized in that the asymmetrical cross sections of  
the loops (15a) are adapted to enable the rings or bands  
15 (16a) to be wound closer to the stack (10).

6. A surge arrester (1) according to claim 1,  
characterized in that the asymmetrical cross sections of  
the loops (15a) are adapted such that the shapes of the  
20 rings or bands (16a) become approximately circular.

7. A surge arrester (1) according to claim 1,  
characterized in that the cross sections of the loops (15a)  
essentially correspond to two mirror-inverted rhombs or  
25 rhomboids (V, H).

8 A surge arrester (1) according to any if the preceding  
claims, characterized in that the rings or bands (16a) are  
wound of aramide fibre or PBO fibre with an epoxy or vinyl  
30 ester matrix.